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Reading Strategies of College-level Japanese EFL Learners : Development of Strategy Use According to Proficiency Level

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Abstract :

The purpose of this study is to identify recognized strategies by Japanese EFL college students, depending on the proficiency level. One hundred and sixty-three Japanese EFL college students, divided into three groups, i. e., high-, intermediate-, and low-level, answered the questionnaire of reading strategy use. In order to examine general tendencies of strategy use, factor analysis was conducted at the three differing levels of proficiency. Six factors were identified. The means of six factors indicates that linguistic proficiency level tends to positively correlate with the frequency of recognized strategies. Strategies, which seem to contribute to the development of reading strategy use, are top-down strategies and problem-solving strategies.

1. Introduction

Research has been conducted over the past few decades into what happens in readers' minds and what reading comprehension strategies learners use. Interactive processes, combining top-down and bottom-up strategies, describe the effective reading strategies of good readers (Rumelhart, 1977 ; Stanovich, 1980). Understanding the strategies used by good readers can help poor readers develop

strategic awareness. Differences in reading strategies between good and poor readers have been discussed in both L2 and L1 settings. One influential factor in reading processes between good and poor L2 readers, until they pass a threshold level, is their linguistic abilities (Clarke, 1979). High-proficiency learners whose decoding processes are almost automatic employ global top-down strategies, whereas low-proficiency learners whose decoding processes are problematic rely on bottom-up/local strategies (Kadota & Noro, 2001).

Numerous studies have been conducted to examine the differences in reading processes between good readers and poor readers (Baker & Brown, 1984; Hosenfeld, 1977; Ono, et al., 2001; Yamashita & Yokoyama, 2011; Yoshida et al., 1997). Poor readers tend to be low-level learners, whereas good readers tend to be high-level learners. However, the criteria of "good" and "poor" are not a dichotomy but a continuum; the boundary between the two is not definite. As for low-level learners, it is too broad if we classify all such learners as "poor readers" because it is assumed that there are different levels of reading strategy use within each proficiency level, such as lower-level, i. e., elementary, and higher-level, i. e., intermediate. Some learners might stay closer to the stage of being good strategy users, whereas some might not, unable to employ effective strategies. What is important for EFL teachers is the data analysis of the three groups, i. e., low-, intermediate- and high-level, so that we can provide lower-level (i. e., low and intermediate) learners with feasible goals in language classes, referring to strategy use by high-level learners. It is necessary to examine the group of readers between good and poor readers in order to identify the phases of strategy use development.

Using data from questionnaires, Carrell (1989) performed factor analysis to examine how readers generalize reading in their minds and recognize what they are doing during reading comprehension. Finding groups of perceived strategies might

be a useful guideline for teachers to systematically instruct strategies, as strategies are used not in isolation but rather "in sequences or clusters" in the reader's mind (Cohen, 2011, p. 10). However, few studies investigate the whole structure of strategies, in which correlated strategies are classified as a subdivision of categories (Otsuka, 2002).

This study, following the method of Taki (2006), deals with differences in the frequency of recognized strategies among three proficiency group. I hope the study should help lower-level learners find effective strategies to advance to a higher-level reading category.

2. Method

2.1 The Aim of the Study

The aim of this study is to identify strategy use that represents three proficiency groups, comparing the frequency of use of strategies among the three groups. The participants are divided into three groups : low-level (LG), intermediate (IG), and high-level group (HG), depending on the proficiency level. Factor analysis is conducted to examine general tendencies of strategy use at the three differing levels of proficiency.

The purposes of the study are as follows :

1. To determine factors representing recognized strategies among high-, intermediate-, and low-level learners
2. To compare means of frequency of recognized strategy use of factors for high-, intermediate-, and low-level learners

2.2 Participants

One hundred and sixty-three college students participated in this study. The participants were recruited from a four-year private university located in a provincial city and a national university located in another middle-sized city. Participants were divided into three groups : LG ($n = 61$), IG ($n = 61$), and HG ($n = 41$), noting participant numbers for conducting Factor Analysis.

As for IG and LG, participants were male and female first-year college students majoring in economics, business administration, law, and social studies at the private university. They were divided into two groups based on TOEIC Bridge reading scores : IG ($n = 61$) and LG ($n = 61$), which showed the similar *SD* (IG : 4.18 ; LG : 4.27) (IG : $M = 77.61$, $SD = 4.18$; LG : $M = 56.49$, $SD = 4.27$, $p < .001$). (The correlation between listening and reading is .69, $p < .01$).

The high-level students were four 3rd- and 4th-year male and female students majoring in English language and literature at a private university and 37 3rd-year male and female students majoring in education and literature at a national university. Here, "high-level" refers to students who have achieved scores of 600 or more on the TOEIC (total score of Listening and Reading). According to reference books for TOEIC preparation, an applicant's first goal is to score 600, which is considered an indication of basic communication skills (Kamijo & Smillie, 2013 ; Ooga et al., 2008). The correlation between reading scores and total TOEIC scores is .810 ($p = .000$). TOEIC scores of 600 are much higher than those of LG and IG (276-550 based on the conversion table for the TOEIC and TOEIC Bridge). TOEIC Bridge scores were converted to TOEIC scores based on ETS guidelines. There are significant differences between the three groups (High : $M = 732.07$, $SD = 100.24$, Intermediate : $M = 465.90$, $SD = 57.46$; Low : $M = 290.18$, $SD = 15.00$, $F\ (160) = 624.35$, $p < .005$, H > I > L).

2. 3 Materials

2. 3. 1 Multiple-choice Tests

To examine general proficiency English abilities, multiple-choice Tests (MC tests), namely the Test of English as International Communication [TOEIC]/TOEIC Bridge was used to categorize participants into three proficiency-level groups : low, intermediate, and high. The TOEIC, developed by English Testing Service (ETS), is an objective MC test widely used in Japan. It consists of a listening part (100 questions) and a reading part (100 questions). The TOEIC Bridge Test, also developed by ETS, is designed to measure basic communication abilities for low- and intermediate-proficiency learners, and comprises a listening part (50 items) and a reading part (50 items).

2. 3. 2 Questionnaire

Thirty-four strategies were chosen based on categories of bottom-up, top-down, and support strategies, following Ikeda and Takeuchi (2000) and Mokhtari and Sheorey (2002). Participants chose one response on a five-point Likert scale : 1－Do not use the strategy at all, 2－Seldom use the strategy, 3－Sometimes use the strategy, 4－Often use the strategy, and 5－Always use the strategy. Factor analysis was carried out to categorize the strategies recognized by the participants. As for the question items in the questionnaire developed for the study, reference was made to Ikeda and Takeuchi (2000). They developed a self-report questionnaire for EFL reading, which was revised several times to produce a more valid and reliable list of reading strategies. Ikeda and Takeuchi (2000) reported that "the reliability of the completed version was satisfactorily high at . 86 on Cronbach alpha" (p. 23). Their question items were suitable for examining EFL Japanese learners, and confirm the validity and reliability of the questionnaire used in this study.

Ikeda and Takeuchi (2000) report that as for recognized strategies, "students

tend to overestimate (not underestimate) the frequency of strategy use", because they recollect "the single experience in which they had used that strategy most often" (p. 25). Cohen (2011, 2012) confirms the above-mentioned statement for participant reports when learners are not engaged in language learning tasks. However, the mean scores of frequency of recognized strategies obtained in the study are used here, as all proficiency groups answered the questionnaire in the same conditions.

2.4 Procedures

The participants took TOEIC/TOEIC Bridge prior to the 34-item questionnaire. The questionnaire, in Japanese, was distributed by the author and three colleagues to 163 Japanese college students in their English classes. Most respondents answered the questions within 20 minutes, although they were allowed to take as long as they needed to complete the entire questionnaire.

3. Results

3.1 Factor Loadings and Six Factors

Table 1 indicates the results of reading strategy factor loadings. Exploratory factor analysis was conducted using the least squares method and promax rotation. The eigenvalue was set based on one, referring to the scree criterion. Factor loadings of 0.4 or above were underlined and factors with more than three strategies were selected. As shown in Table 6, the responses were categorized into six factors.

Table 1. *Factor Loadings (n=163)*

Item	Factor Loadings						
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Commonalities
16. Inferring main points	.841	−.083	−.015	−.018	.123	.033	.745
17. Inferring a writer's intention	.728	.049	.201	−.183	.052	−.078	.655
21. Summarizing	.613	−.197	.208	−.008	−.046	.179	.332
18. Understanding a topic sentence	.604	.068	.036	.036	.137	−.078	.634
25. Predicting what will come next	.585	−.034	.057	.118	−.104	−.062	.688
15. Understanding outline first	.575	−.001	−.287	−.022	−.026	−.109	.398
7. Marking grammatical segments	.033	.906	−.114	−.117	−.073	−.065	.755
6. Paying attention to segments	−.154	.878	−.108	.001	.069	−.008	.670
24. Paying attention to conjunctions	−.152	.548	.156	−.063	.068	.099	.585
20. Inferring contents from pictures	−.114	−.126	.879	−.042	.025	−.002	.653
19. Inferring contents from the title	.183	.063	.712	−.014	−.075	.090	.588
26. Relating background knowledge	.071	−.055	.521	.013	.095	−.012	.585
30. Rereading	−.084	−.081	.032	.977	.003	.007	.986
31. Rereading parts & paragraphs	−.082	−.075	−.112	.806	.030	−.006	.552
29. Changing speed	.047	.077	.157	.437		−.042	.423
8. Guessing words from the context	.094	.077	−.089	−.009	.846	.089	.813
11. Guessing sentences from the context	−.158	.018	.153	.022	.619	.122	.448
9. Guessing words from the suffix	.281	−.097	.017	.061	.593	−.024	.570
14. Paying attention to structures	−.039	−.077	.042	.072	.165	.683	.378
13. Paying attention to pronouns	.019	.137	−.019	.075	−.045	.628	.948
12. Paying attention to grammar rules	.269	.029	−.031	−.009	−.216	.540	.583

3. 2 Comparison of Mean Differences among Three Groups

Table 2 shows the mean scores and standard deviations for the six factors that were identified for the high-level, intermediate-level and low-level groups, separately and combined. Internal reliability according to Cronbach's alpha was 0. 87, indicating sufficient reliability.

Table 2. *Mean Scores and Standard Deviation of Six Factors (N=163)*

Question Items (Partially Abridged)	HG (*n*=41) *M* (*SD*)	IG (*n*=61) *M* (*SD*)	LG (*n*=61) *M* (*SD*)
F1. Inferring Main Ideas and Summarizing	**3.32 (1.14)**	**2.81 (1.07)**	**2.53 (0.99)**
16. I infer main points of the whole text.	3.66 (0.96)	3.07 (1.06)	2.70 (0.95)
17. I infer what the writer intends to say.	3.43 (1.08)	3.13 (1.04)	2.54 (1.01)
21. I summarize the text after reading it.	2.49 (1.05)	2.26 (1.08)	2.21 (0.93)
18. I try to understand topic sentences.	3.68 (0.99)	3.08 (1.00)	2.62 (0.95)
25. I predict what will come next.	3.26 (1.18)	2.70 (0.94)	2.28 (0.90)
15. I skim the text first and then read for details.	3.41 (1.16)	3.11 (1.05)	2.79 (1.08)
F2. Paying Attention to Semantic/Grammatical Segments	**3.59 (1.28)**	**3.54 (1.28)**	**3.13 (1.19)**
7. I write slashes to segment sentences grammatically in order to understand well.	3.02 (1.44)	3.18 (1.28)	2.57 (1.09)
6. I pay attention to the phrase and clause units while reading the text.	3.78 (1.19)	3.61 (1.07)	3.21 (1.13)
24. I pay attention to conjunctions and transition words.	3.95 (1.00)	3.84 (0.90)	3.58 (1.16)
F3. Activating Background Knowledge	**3.75 (1.09)**	**3.40 (1.03)**	**3.00 (1.11)**
20. I infer the contents of the texts from pictures and photographs.	3.70 (1.22)	3.41 (1.05)	3.11 (1.14)
19. I infer the contents of the texts from the title.	3.93 (1.08)	3.43 (1.07)	3.13 (1.13)
26. I link the contents of the texts with what I know.	3.62 (0.94)	3.38 (0.99)	2.74 (1.03)
F4. Rereading and Changing Speed	**3.99 (1.03)**	**3.32 (1.05)**	**2.88 (1.16)**
30. I repeatedly read what I don't understand.	4.20 (0.78)	3.39 (1.04)	3.10 (1.08)
31. I repeatedly read sentences or paragraphs where I get lost.	3.33 (1.15)	2.95 (0.99)	2.74 (1.17)
29. I change reading speed depending on the difficulty.	4.43 (0.80)	3.61 (1.04)	2.75 (1.29)
F5. Guessing from the Context	**4.02 (0.87)**	**3.40 (0.96)**	**3.16 (0.95)**
8. Guessing words from the context.	4.24 (0.73)	3.53 (0.90)	3.36 (0.88)
11. Gussing sentences from the context.	3.83 (0.86)	3.47 (0.90)	3.31 (0.87)
9. Guessing words from the suffix.	4.00 (0.97)	3.20 (1.05)	2.82 (1.01)
F6. Paying Attention to Grammar and Structures	**3.41 (1.20)**	**3.00 (1.08)**	**3.03 (1.10)**
14. I pay attention to sentence structures.	3.78 (1.17)	2.79 (1.16)	2.74 (1.03)
13. I check the meaning of each pronoun.	3.51 (1.12)	3.31 (0.98)	3.30 (1.07)
12. I read the text while focusing on grammatical rules.	2.94 (1.17)	2.90 (1.04)	3.05 (1.15)

Note : HG = high-level group ; IG = intermediate-level group ; LG = low-level group.

As Table 3 statistical analysis using Cronbach's alpha demonstrates, factors 1－6 were sufficiently reliable.

Table 3. *Reliability of Six Factors*

	A
F1	.822
F2	.744
F3	.732
F4	.746
F5	.763
F6	.703

F1 : 'Inferring main ideas and summarizing'
F2 : 'Paying attention to semantic/grammatical segments'
F3 : 'Activating background knowledge'
F4 : 'Rereading and changing speed'
F5 : 'Guessing from the context'
F6 : 'Paying attention to grammar and structures'

F1 was designated as 'Inferring Main Ideas and Summarizing' as it includes strategies of summarizing and inferring key ideas such as main ideas, topic sentences and writer's intention. F2 was designated as 'Paying Attention to Semantic/Grammatical Segments' as it includes the strategies of dividing sentences into grammatical and semantic segments with slashes. F3 was designated as 'Activating Background Knowledge' as this includes strategies of inferring contents by linking information with contents. F4 was designated as 'Rereading and Changing Speed', including strategies of rereading and adjusting reading speed depending on the difficulty of the text. F5 was designated as 'Guessing from the Context' as it includes strategies of inferring from words and sentences. F6 was designated as 'Paying Attention to Grammar and Structures', including strategies of activating grammatical rules and parsing sentence structures.

Table 4 and Figure 1 indicate the results of means of the six factors. One-way ANOVA was conducted in order to compare the three groups' means of each factor.

Table 4. *Comparison of Means Differences Among Three Groups*

Factor	Group	*M*	*SD*	*f*(*ds*)	*p*	η^2	MC*
F1	LG	2. 52	0. 05	41. 86	0. 000	0. 08	H>I>L
	IG	2. 81	0. 06				
	HG	3. 32	0. 72				
F2	LG	3. 12	1. 19	7. 69	0. 001	0. 03	H>L
	IG	3. 54	1. 12				I>L
	HG	3. 59	1. 28				
F3	LG	2. 99	1. 11	18. 59	0. 000	0. 07	H>I>L
	IG	3. 40	1. 03				
	HG	3. 75	1. 09				
F4	LG	2. 88	1. 16	45. 12	0. 000	0. 13	H>I>L
	IG	3. 32	1. 05				
	HG	3. 99	1. 03				
F5	LG	3. 16	0. 95	32. 08	0. 000	0. 12	H>I>L
	IG	3. 40	0. 96				
	HG	4. 02	0. 87				
F6	LG	3. 02	1. 10	5. 82	0. 003	0. 02	H>I
	IG	3. 00	1. 07				H>L
	HG	3. 41	1. 20				

Note : *multiple comparison

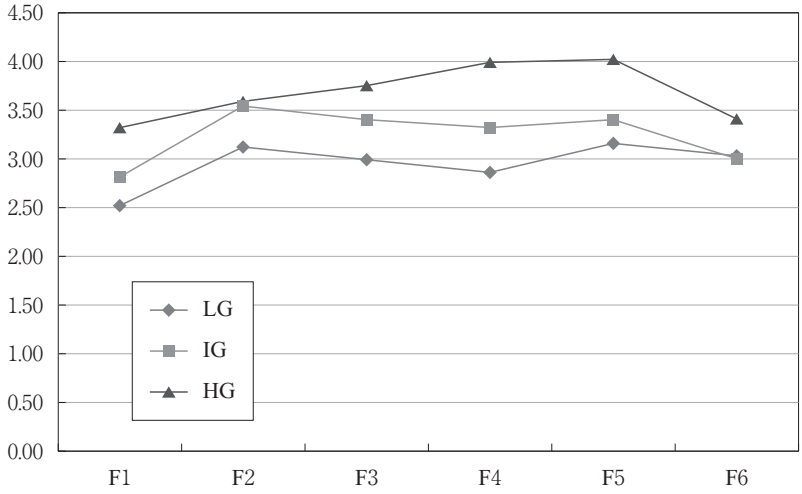

Figure 1. Mean Scores of Six Factors in the HP, IP and LP Groups

F1 'Inferring main ideas and summarizing', F3 'Activating background knowledge', and F5 'Guessing from the context' are categorized as top-down/global strategies, whereas F2 'Paying attention to semantic/grammatical segments' and F6 'Paying attention to grammar and structures' are included as bottom-up/local strategies. As proposed by Mokhtari and Sheorey (2002), F4 'Rereading and changing speed' is labeled as a factor of problem-solving strategies in the category of focused local strategies.

As shown in Table 4 and Figure 1, significant differences in means of factors were apparent among the three proficiency groups. HG showed much higher means of frequency of strategy use than the other two groups except F2 'Paying attention to semantic/grammatical segments', whereas those of most factors for LG showed the lowest. Mean scores of F2 for HG and IG showed almost the same mean of frequency of strategy use. IG demonstrated much higher means of frequency of strategy use than LG except F6 'Paying attention to grammar and structures'. Descriptive statistics are used to describe the basic features of the data in the study. They provide simple summaries about the sample and the measures. As shown in Table 2 of descriptive statistics, F4 'Rereading and changing speed' and F5 'Guessing from the context' by HG showed higher mean scores than other factors [F4 : HG — M = 3. 99 (SD = 1. 03), IG — 3. 32 (1. 05), LG — 2. 88 (1. 16) ; F5 : HG — 4. 02 (0. 87), IG — 3. 40 (0. 96), LG — 3. 16 (0. 95)]. Effective strategies that learners believed they relied on included rereading and adjusting reading speed, and inferring meanings of unknown words and sentences.

4. Discussion

Let us now discuss the results of factor analysis.

1. To determine factors representing recognized strategies at different levels

The six factors determined to be employed by the three groups are both bottom-up/local and top-down/global strategies. As for top-down/global strategies, inferring main ideas, relating contents with background knowledge, and guessing from the context are extracted. As for bottom-up/local strategies, paying attention to semantic/grammatical segments, rereading and adjusting speed depending on the text difficulty, and understanding grammatical rules and sentence structures are determined. It indicates low–level learners might rely on cognitive processes as well as bottom-up strategies, whereas high-level learners may utilize basic strategies in addition to cognitive strategies. However, as far as bottom-up/local strategies are concerned, lower-level learners use bottom-up/local strategies almost the same as higher-level learners such as F2（I and H）and F6（L and I）owing to their inferior linguistic abilities.

Moreover, it is worth noticing that F4 'Rereading and changing speed', which is included in test-taking strategies, demonstrates the highest effect size. This type of problem-solving strategies might have developed implicitly or explicitly by answering questions many times during high school days. F5 'Guessing from the context' showed the second highest effect size. Both factors demonstrated higher mean scores than other factors. It indicates effective strategies that learners believed they relied on included rereading and adjusting reading speed, and inferring unknown words and sentences.

2. To compare means of recognized strategy use of factors for high-, intermediate-, and low-level learners.

Regarding top-down/global strategies, the means of factors indicates that linguistic proficiency level positively correlates with the frequency of recognized strategies : high-level learners are assumed to be more aware of strategy use than

other two groups, whereas low-level learners are unlikely to be aware of effective strategies. As for the intermediate-proficiency group, mean scores of frequency of strategy use mostly fell between those of the high- and low-proficiency groups. However, regarding bottom-up strategies, it is not always the case. Low-level learners use nearly the same frequency of strategy use as intermediate-level learners (F6), whereas intermediate-level learners employ similar frequency of strategy as high-level learners (F2) probably owing to insufficient decoding processes. High-level learners probably use their cognitive resources for top-down/global strategies due to their higher linguistic abilities. Low-level learners might have not yet developed inferior linguistic abilities to acquire these strategies.

5. Conclusion

First, the results indicate linguistic proficiency level positively correlates with the frequency of recognized strategies : high-level learners are assumed to be more aware of strategy use than the other two groups. Therefore, proficiency and reading level is a crucial factor affecting strategy use by Japanese EFL learners. High-proficiency learners tend to be more aware of strategy use than intermediate- and low-proficiency learners concerning most bottom-up/local and top-down/global strategies. On the other hand, low-proficiency learners demonstrated low mean scores for most factors and intermediate-level learners are located between these two groups, which indicates that learners might be able to use strategies effectively once they pass a threshold level (Alderson, 1984 ; Grabe & Stoller, 2002, Grabe, 2009). Owing to their high linguistic knowledge, high-proficiency Japanese EFL learners are likely to use top-down/global strategies with efficient bottom-up/local strategies more frequently than the other two groups. Other factors such as activation of working memory, integration of cognitive processes, and knowledge resources

might be related to their comprehension. Moreover, learners' individual factors, such as their learning styles, interest, efficiency, and difficulty of acquiring strategies might be related to it.

The differences in strategy among the three-levels of learners are 'Adjusting reading speed' and 'Inferring from the context'. These strategies are considered efficient and eventually lead learners to find main ideas and topic sentences in the context (Kadota & Noro, 2001). However, the findings also revealed that the LG participants might rely on context to compensate for their reading deficiencies (Stanovich, 1980, 2000) and almost as many IG participants used some of the inferring strategies as did those in the HG. However, the use of these strategies might not have contributed as effectively to their comprehension of the passages due to the limited linguistic abilities.

Furthermore, 'inferring main ideas and summarizing' was found to be an effective strategy used by high-proficiency learners. This finding confirmed that what distinguishes high-proficiency learners from the other two groups are the high mean scores for 'identifying main ideas/topic sentences,' which is regarded as a highly elaborated inferring strategy that good readers are able to use effectively. Learning how to identify main ideas/topic sentences helps learners understand the overall logical organization of expository text, in other words, the topic-level structures. Topic-level structure shows the main ideas of rhetorical relations such as *collection*, *causal*, *response*, *problem and solution*, *comparison*, and *description* (Meyer & Rice, 1982). The subjects form strategy clusters, which are combined with another cluster of strategies (Macaro, 2006). The relationships between strategies might show a similar disposition. However, the relationship between strategies and reader awareness should be investigated more comprehensively before conclusions are drawn.

Second, the findings imply that there might be differences in development of

strategy use, relating to linguistic/reading abilities. High-proficiency learners believed or responded that they pay attention to what they read when they attempt to solve problems. When they recognize that they do not understand the text, they sometimes pause and repeatedly read the part that they do not understand. In contrast, low-proficiency learners might not develop these strategies and probably give up trying to comprehend what they do not understand owing to their limited linguistic abilities. This situation implies that additional strategies relating to developmental phases may possibly be found. If an entire series of strategy use can be developed, it would greatly contribute to reading strategy instruction in classrooms. Teachers will be able to teach appropriate strategies to their students by understanding the relationship between proficiency level and strategy use.

As one attainable goal for instruction, 'rereading and adjusting speed' helps learners employ skimming and skipping to distinguish what is important from what is not, which has been found to be used by high-proficiency and intermediate-proficiency learners. As frequently advocated in reading classes, encouraging phrase reading, i. e., 'paying attention to semantic/grammatical segments' may be one of the most effective strategies that lead lower-level readers to become successful ones. However, learners' individual factors such as their learning styles, interest, efficiency, and difficulty of acquiring strategies might be related to it. Some learners might feel reluctant to change strategies that they have used for so long. In the future, more attention should be paid to intermediate-proficiency learners who lie between the two poles in order to observe a developmental phase of strategy use.

There are limitations to the data obtained in this study. The low frequency of recognizing certain strategies does not necessarily indicate inability to implement them. For example, some good readers might be unaware of using phrase reading (No. 6) owing to decoding processes being almost automatic. We should bear in

mind that the inventory of strategies is only one source of information for analyzing student reading abilities. Triangulation methods, which involve other means of investigation, are required to reveal further differences in linguistic ability (Mokhtari & Sheorey, 2002). To broaden the research, more lower-level learners should be recruited in future studies for confirmation.

Explicit instruction in reading strategy is important for learners to be autonomous readers. It is my hope that these research findings will help L2 teachers improve reading instruction in their language classes.

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